

CHAPTER 2

DESCRIPTION OF THE UPPER ELK RIVER WATERSHED

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2.1. BACKGROUND. The Upper Elk River Watershed contains productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The plateau of the watershed receives slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation regions and is characterized by high gradient streams.

Tims Ford and Woods Reservoirs, managed by TVA, are popular boating and fishing areas. The lakes support largemouth and smallmouth bass, while areas below the dams are fished for stocked rainbow trout. The land supports cotton, corn, and soybean production as well as swine and cattle.

This Chapter describes the location and characteristics of the Upper Elk River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Upper Elk River Watershed is located in Middle Tennessee and includes parts of Bedford, Coffee, Franklin, Giles, Grundy, Lincoln, Marshall, and Moore Counties.

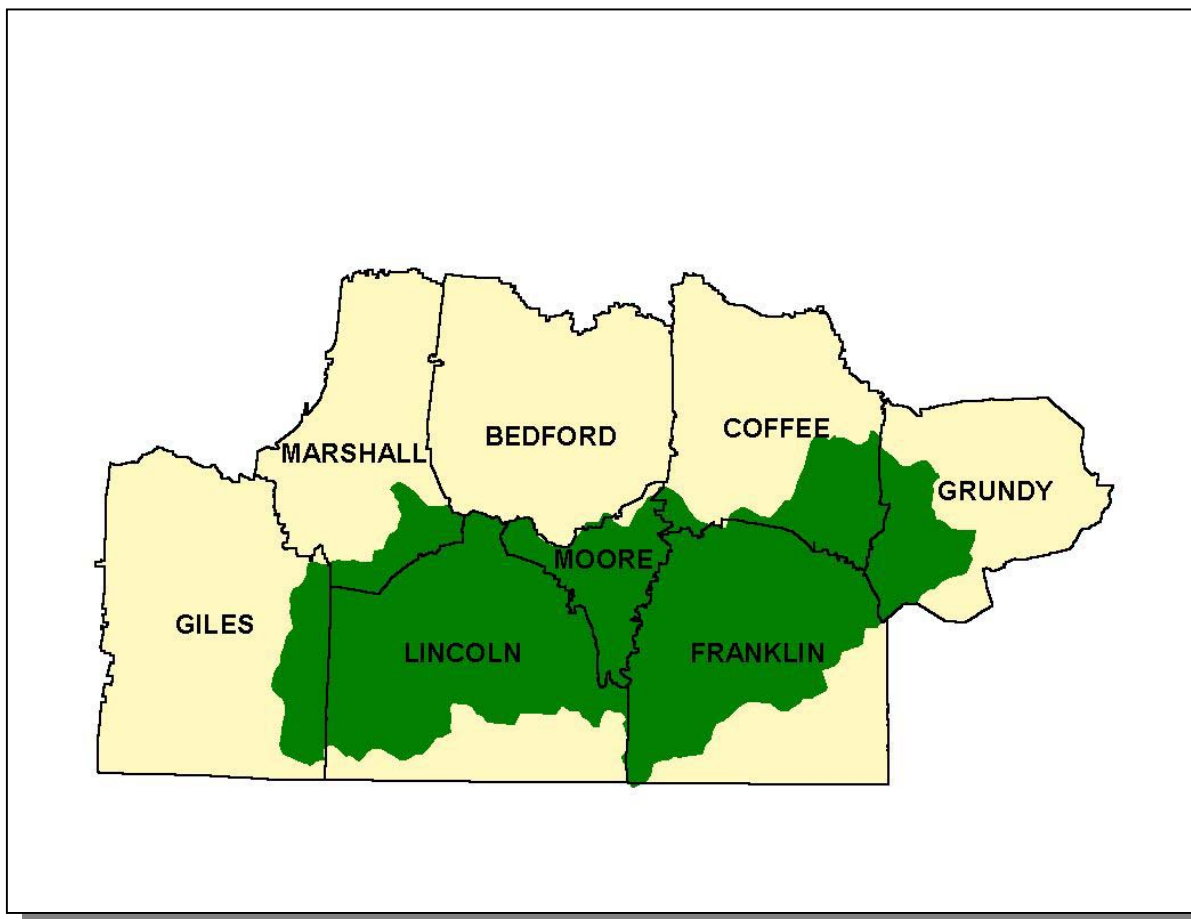


Figure 2-1. General Location of the Upper Elk River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Lincoln	33.4
Franklin	30.1
Moore	9.7
Coffee	8.7
Grundy	7.6
Giles	6.1
Marshall	4.3
Bedford	0.1

Table 2-1. The Upper Elk River Watershed Includes Parts of Eight Middle Tennessee Counties.

2.2.B. Population Density Centers. Six state highways and two interstates serve the major communities in the Upper Elk River Watershed.

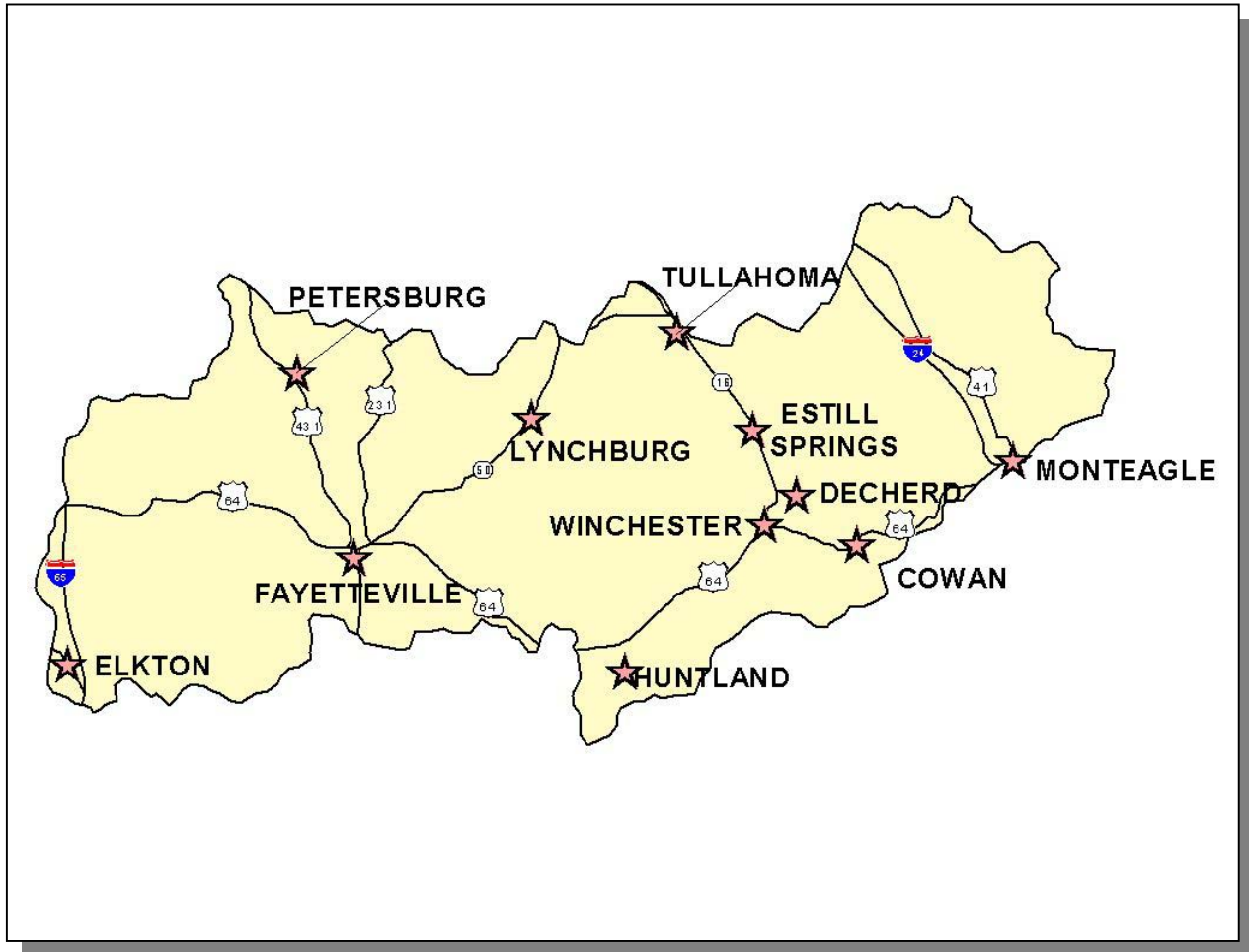


Figure 2-2. Municipalities and Roads in the Upper Elk River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Tullahoma	18,835	Coffee, Franklin
Fayetteville*	7,211	Lincoln
Winchester*	6,515	Franklin
Lynchburg*	5,241	Moore
Decherd	2,326	Franklin
Cowan	1,752	Franklin
Estill Springs	1,466	Franklin
Monteagle	1,029	Marion, Grundy
Huntland	854	Franklin
Petersburg	503	Lincoln, Marshall
Elkton	501	Giles

Table 2-2. Municipalities in the Upper Elk River Watershed. Population based on 1996 census (Tennessee Blue Book). Asterisk (*) indicates county seat.

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Upper Elk River Watershed, designated 06030003 by the USGS, drains approximately 1,277 square miles before flowing in to the Lower Elk River Watershed.

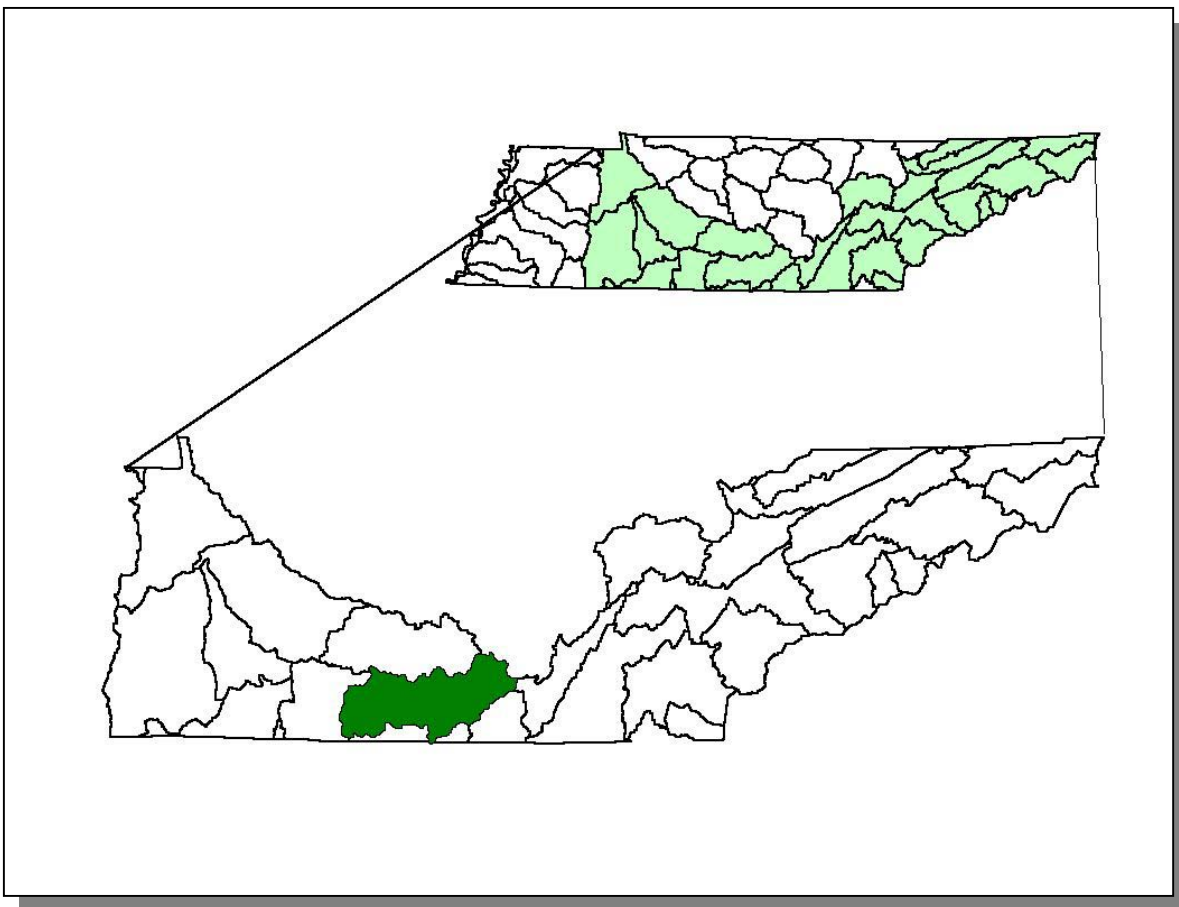


Figure 2-3. The Upper Elk River Watershed is Part of the Tennessee River Basin.

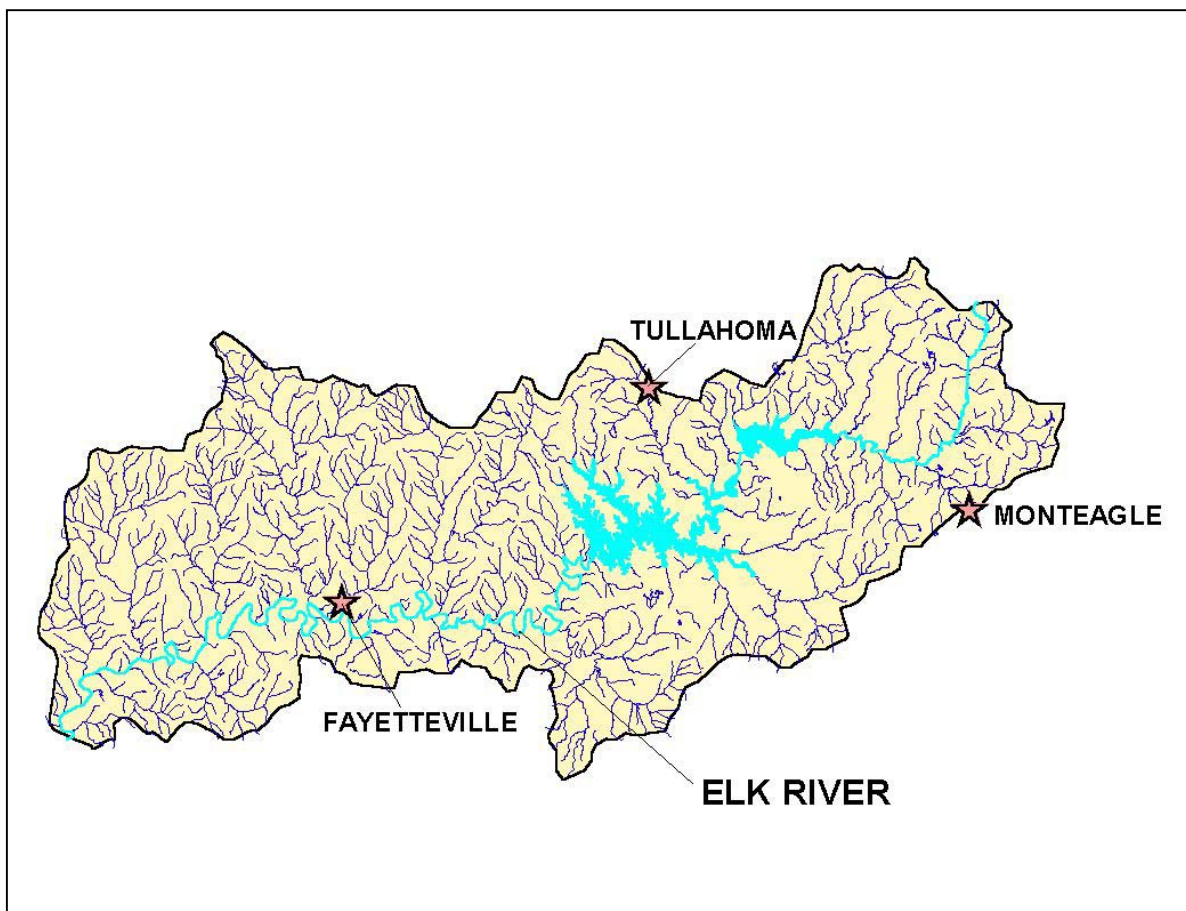


Figure 2-4. Hydrology in the Upper Elk River Watershed. There are 1,813 total stream miles recorded in River Reach File 3 in the Upper Elk River Watershed. Location of the Elk River, Tims Ford and Woods Reservoirs, and the cities of Fayetteville, Monteagle, and Tullahoma are shown for reference.

2.3.B. Dams. There are 22 dams inventoried by TDEC Division of Water Supply in the Upper Elk River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

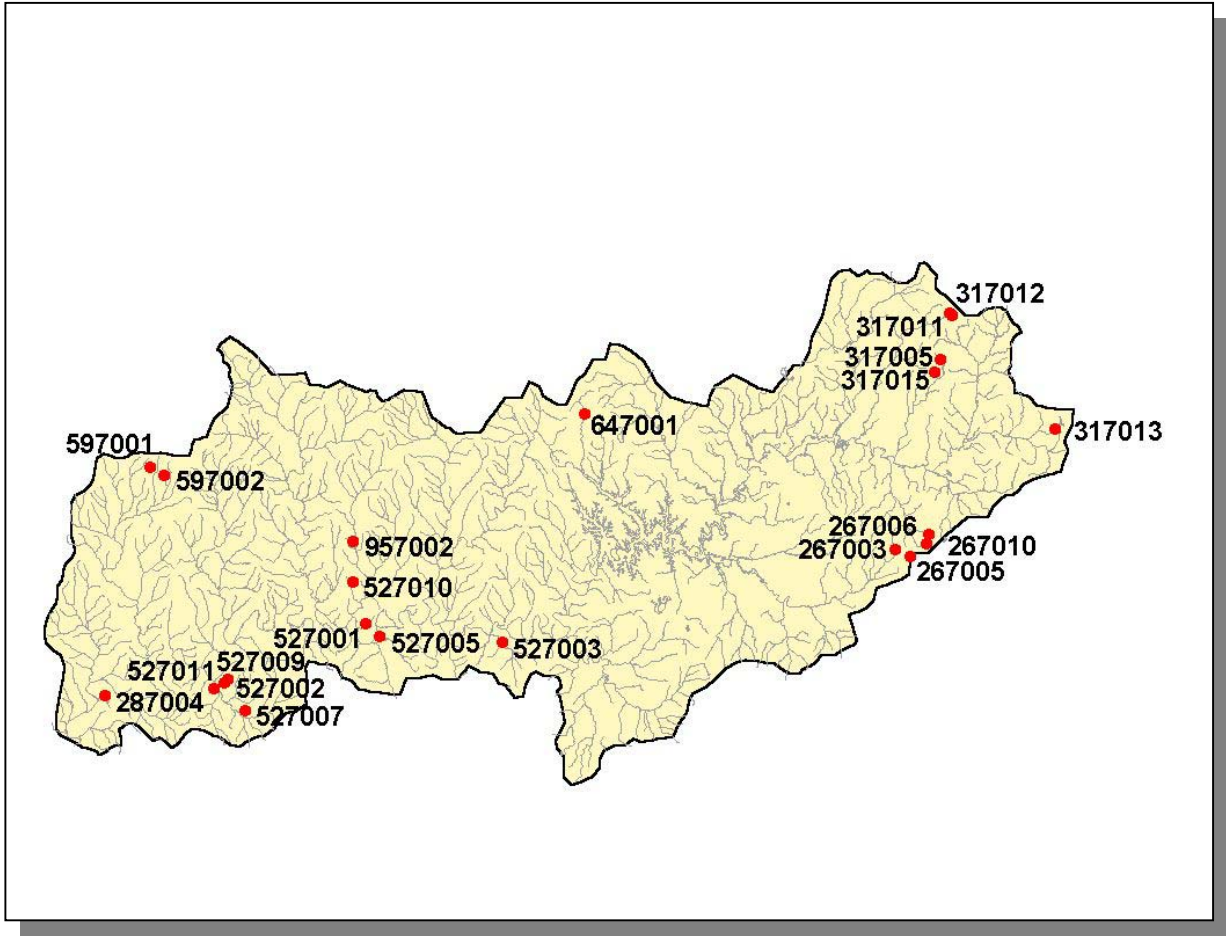


Figure 2-5. Location of Inventoried Dams in the Upper Elk River Watershed. More information is provided in Upper Elk-Appendix II and on the TDEC homepage at: <http://gwidc.gwi.memphis.edu/website/dams/viewer.htm>

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

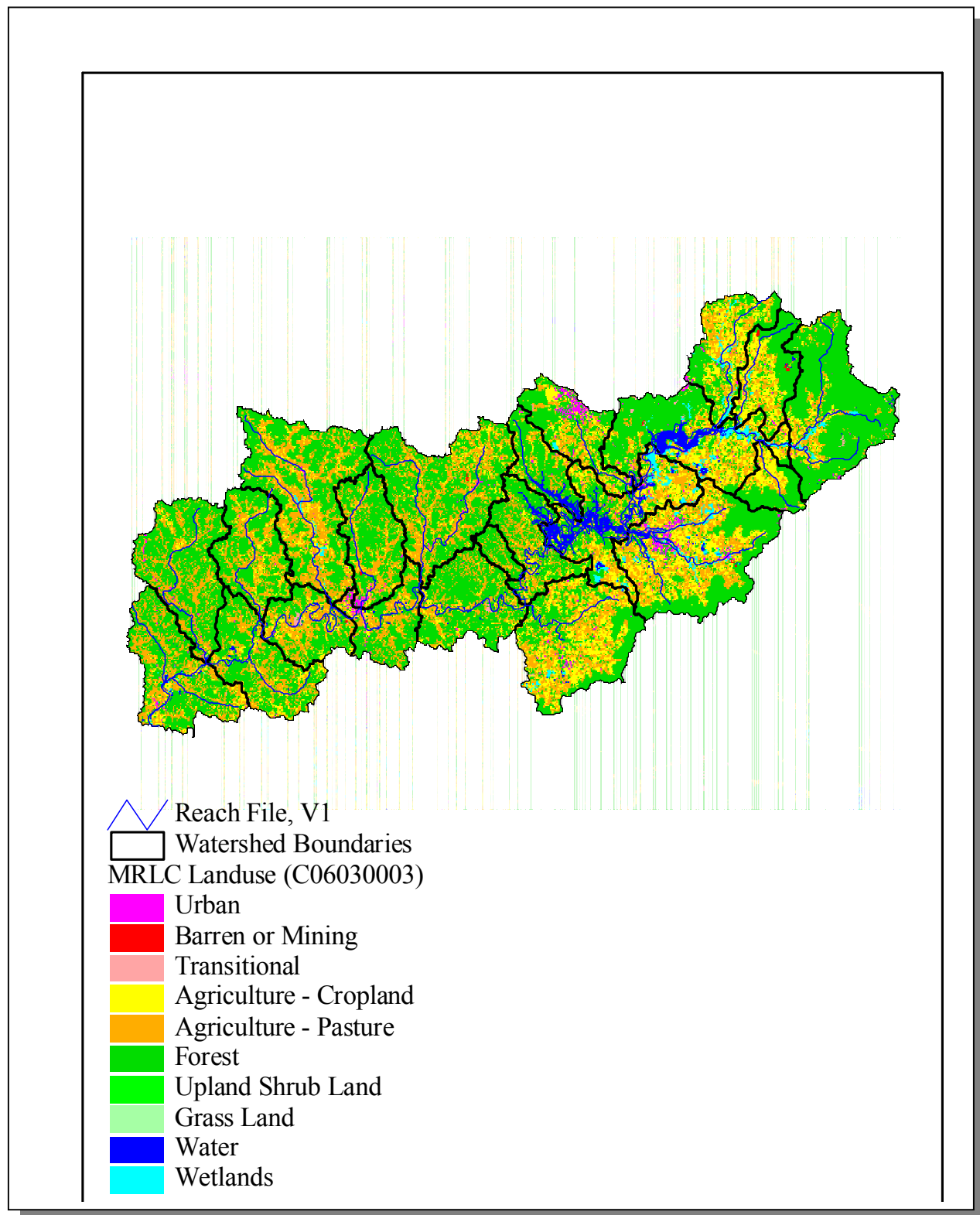


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

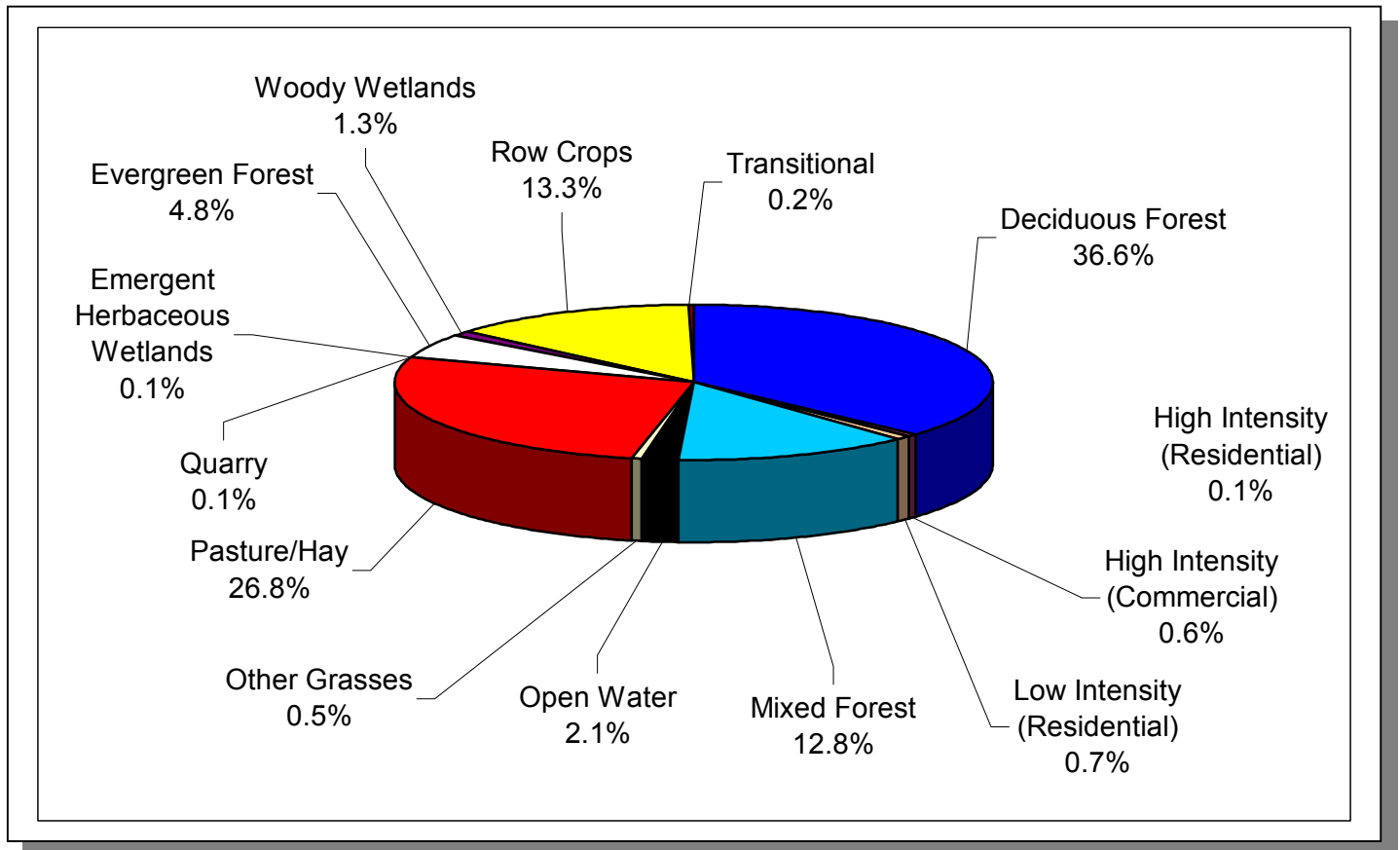


Figure 2-7. Land Use Distribution in the Upper Elk River Watershed. More information is provided in Upper Elk-Appendix II.

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Upper Elk River Watershed lies within 2 Level III ecoregions (Interior Plateau and Southwestern Appalachians) and contains 4 Level IV subecoregions (Griffen, Omernik, Azavedo):

- The Cumberland Plateau's (68a) tablelands and open low mountains are about 1000 feet higher than the ecoregion to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. The plateau surface is less dissected with lower relief than other ecoregions. Elevations are usually 1200-2000 feet, with the Crab Orchard Mountains reaching over 3000 feet. Pennsylvanian-age conglomerate, sandstone, siltstone, and shale is covered by mostly well-drained, acid soils of low fertility. The region is forested, with some agriculture and coal mining activities.
- The Plateau Escarpment (68c) is characterized by steep, forested slopes and high velocity, high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvanian-age shale, siltstone, sandstone, and conglomerate. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-tulip poplar, sugar maple-baswood-ash-buckeye), with hemlock along rocky streamsides and river birch along floodplain terraces.
- The Eastern Highland Rim (71g) has level terrain, with landforms characterized as tablelands of moderate relief and irregular plains. Mississippian-age limestone, chert, shale, and dolomite predominate, and karst terrain sinkholes and depressions are especially noticeable between Sparta and McMinnville. Numerous springs and spring-associated fish fauna also typify the region. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions to the east. Bottomland hardwood forests were once abundant in some areas, although much of the original bottomland forest has been inundated by several large impoundments. Barrens and former prairie areas are now mostly oak thickets or pasture and cropland.
- The Outer Nashville Basin (71h) is a heterogeneous region, with rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally no-cherty Mississippian-age

formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forest with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

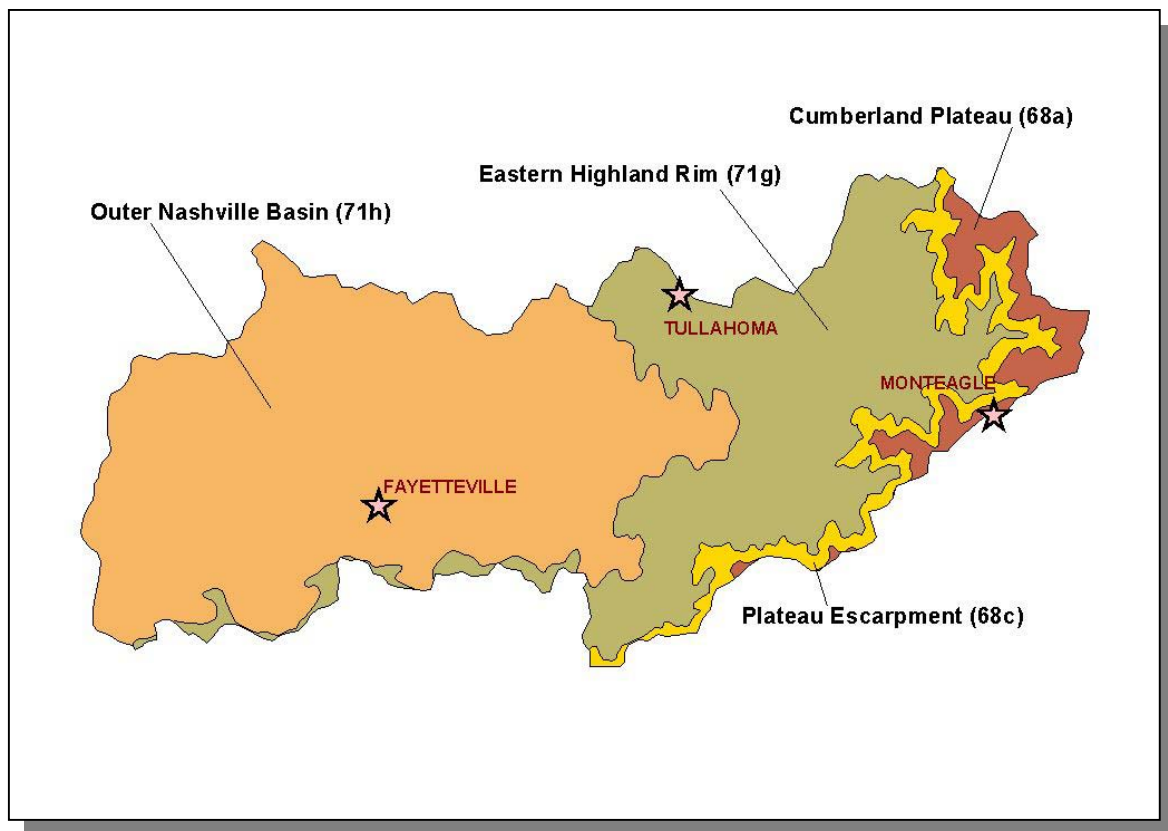


Figure 2-8. Level IV Ecoregions in the Upper Elk River Watershed.

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

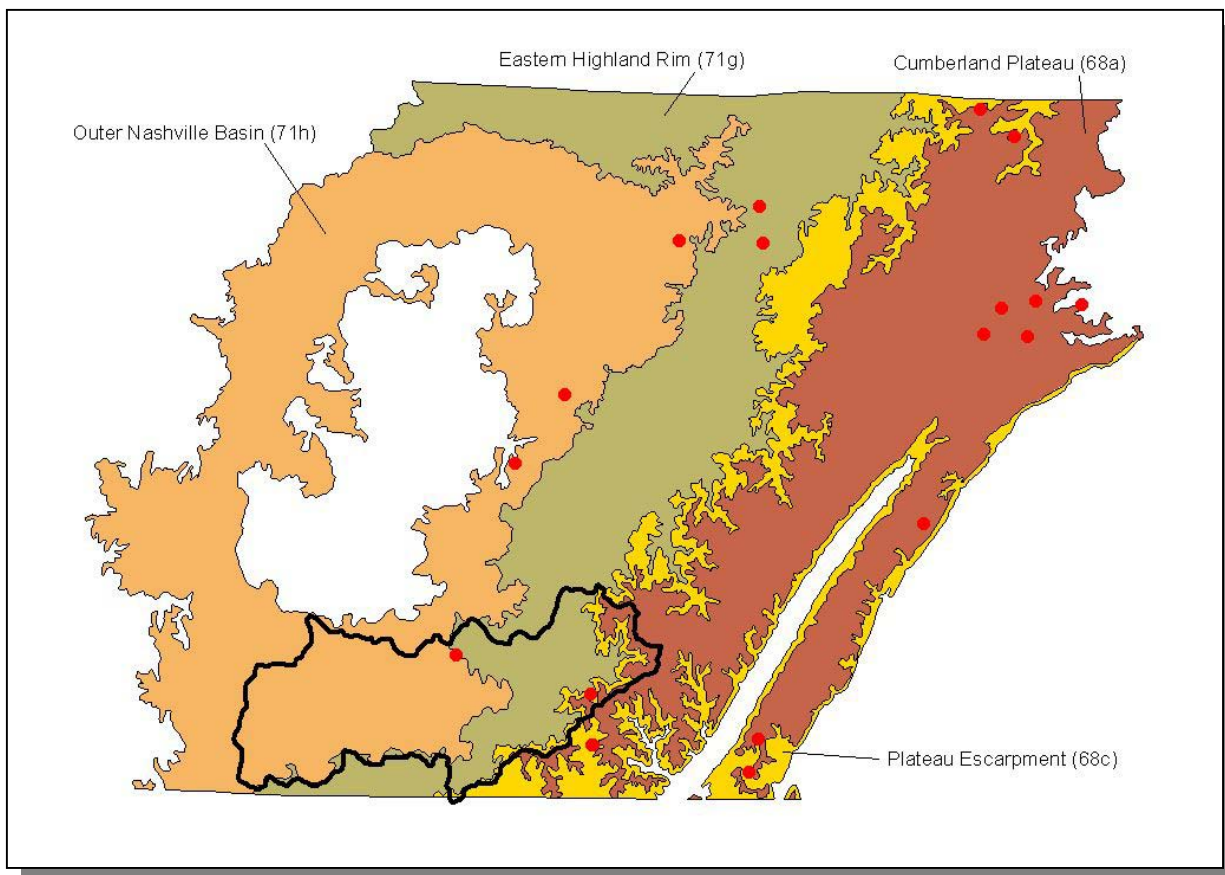


Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 68a, 68c, 71g, and 71h. The Upper Elk River Watershed is shown for reference. More information is provided in Upper Elk-Appendix II.

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Areas. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. The Upper Elk River Watershed has one Designated State Natural Area:

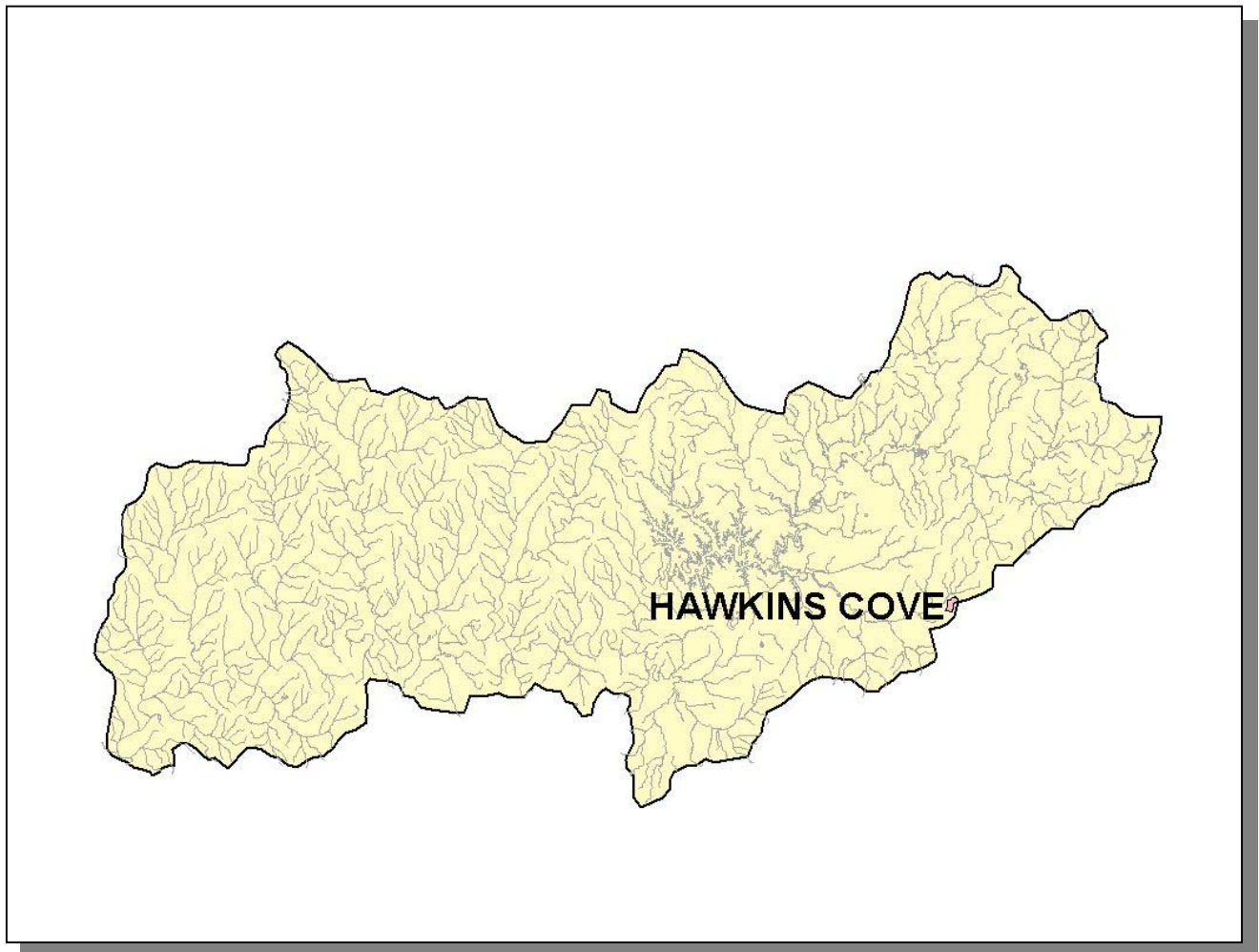


Figure 2-10. Hawkins Cove Designated State Natural Area is in the Upper Elk River Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	1
Insects	1
Mussels	13
Snails	3
Amphibians	1
Birds	6
Fish	4
Mammals	3
Reptiles	0
Plants	55
Total	87

Table 2-3. There are 87 Rare Plant and Animal Species in the Upper Elk River Watershed.

In the Upper Elk River Watershed, there are four rare fish species, thirteen rare mussel species, and three rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
<i>Carpionodes velifer</i>	Highfin carpsucker		D
<i>Fundulus julisia</i>	Barrens topminnow	MC	E
<i>Etheostoma cinereum</i>	Ashy darter	MC	T
<i>Etheostoma wapiti</i>	Boulder darter	LE	E
<i>Dromus dromas</i>	Dromedary pearlymussel	LE	E
<i>Fusconaia edgariana</i>	Shiny pigtoe	LE	E
<i>Fusconaia cuneolus</i>	Fine-rayed pigtoe	LE	E
<i>Hemistena lata</i>	Cracking pearlymussel	LE	E
<i>Conradilla caelata</i>	Birdwing pearlymussel	LE	E
<i>Obovaria subrotunda</i>	Round hickorynut		
<i>Pegias fabula</i>	Little-wing pearlymussel	LE	E
<i>Pleurobema oviforme</i>	Tennessee clubshell		
<i>Ptychobranhus subtentum</i>	Fluted kidneyshell	C	
<i>Quadrula intermedia</i>	Cumberland monkeyface	LE	E
<i>Toxolasma cylinderellus</i>	Pale lilliput	LE	E
<i>Toxolasma lividum</i>	Purple lilliput		
<i>Villosa fabalis</i>	Rayed bean		
<i>Leptoxis subglobova umbilicata</i>	Umbilicate rocksnail		
<i>Lithasia geniculata</i>	Ornate rocksnail		
<i>Lithasia lima</i>	Warty rocksnail		

Table 2-4. Rare Aquatic Species in the Upper Elk River Watershed. Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service, MC, Management Concern for U.S. Fish and Wildlife Service; C, Candidate species for listing by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at <http://www.state.tn.us/environment/nh/tnanimal.html>.

2.6.C. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at <http://www.state.tn.us/environment/epo/wetlands/strategy.zip>.

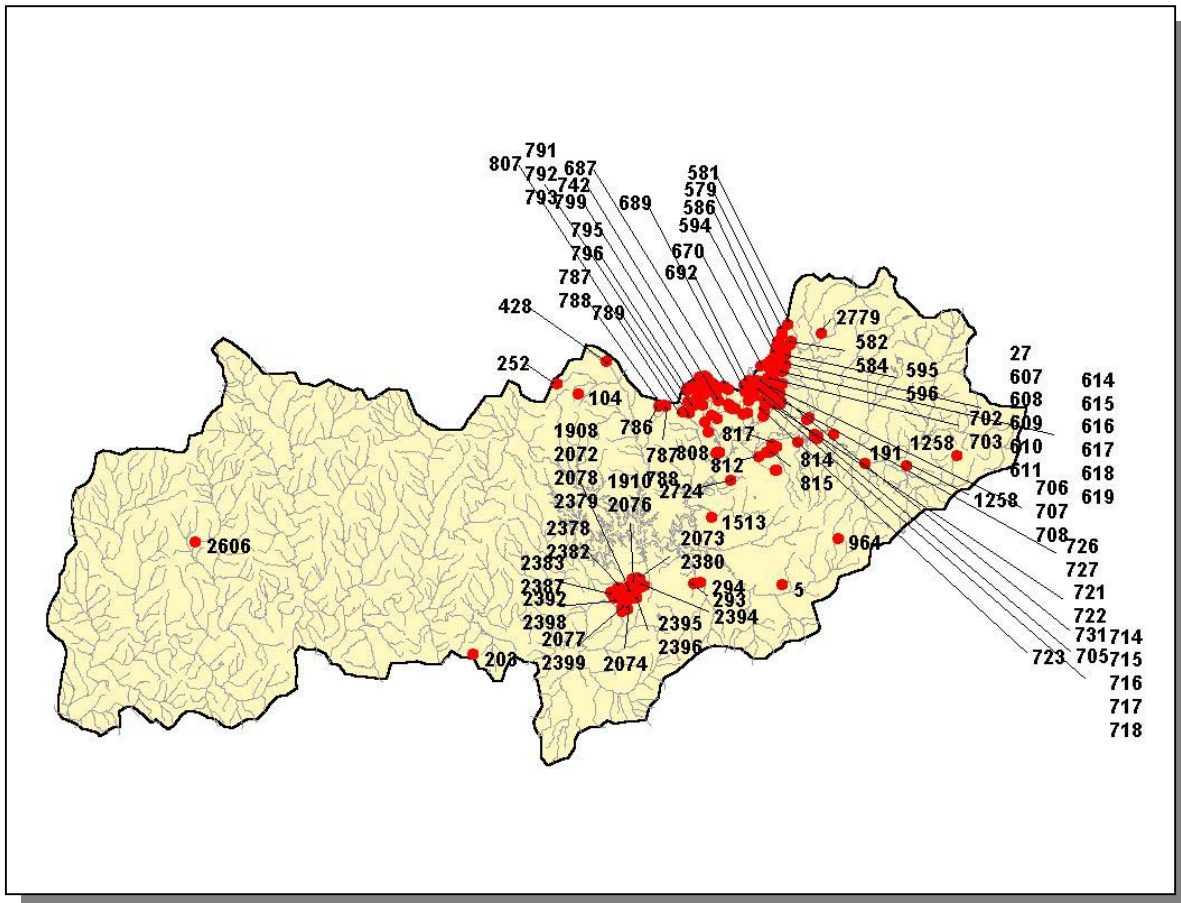


Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Upper Elk River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands in the watershed. More information is provided in Upper Elk-Appendix II.

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of one stream in the Upper Elk River Watershed:

Elk River, significant recorded archaeological sites; fine float and game fish stream.

RIVER	SCENIC	RECREATION	FISH	WILDLIFE	HISTORIC	CULTURAL
Elk River	X	X	X	X	X	X

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at <http://www.ncrc.nps.gov/rtca/nri/tn.htm>

2.7.B. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- Tims Ford State Park, containing the 10,700 acre Tims Ford Reservoir and 5 miles of paved hiking trails.
- South Cumberland Recreation Area, located in Monteagle, is part of ten different park areas and offers a museum, scenic sites, and hiking trails.

In addition, many local interpretive areas are common, most notably, Elkton City Park and Drycreek Beach in Winchester.

2.7.C. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages one Wildlife Management Area in the Upper Elk Watershed.

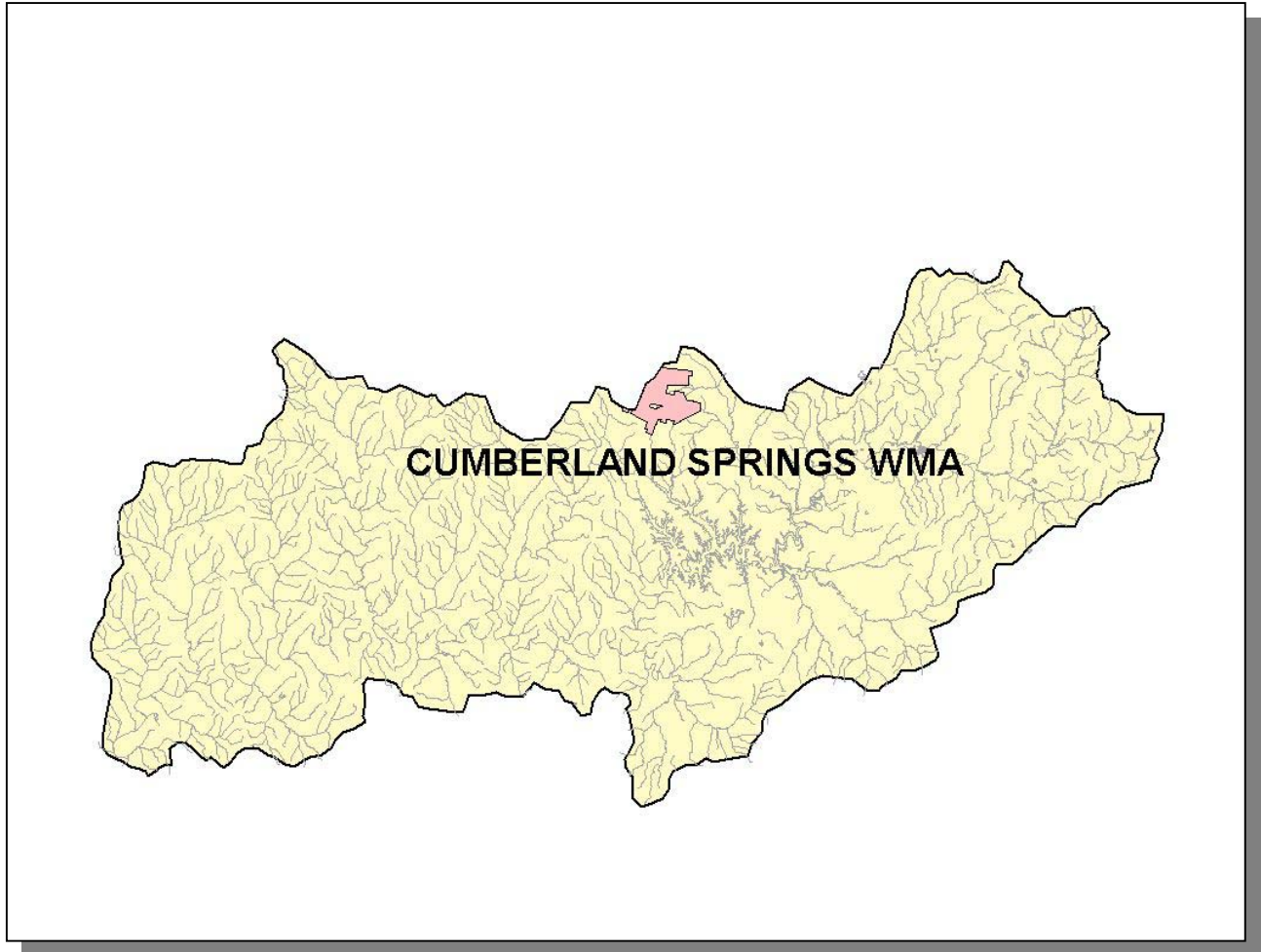


Figure 2-12. TWRA Manages Wildlife Management Areas in the Upper Elk River Watershed.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

<http://www.state.tn.us/environment/wpc/publications/riv/>

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Agency Creek	2		3	Lick Creek			2
Big Lost Creek	1	2	1	North Mouse Creek	3	2	
Bullett Creek	2		3	Oostanaula Creek	3	3	
Candies Creek	2	2		Price Creek	2		
Chatata Creek	2	3	2	Rogers Creek	3	3	
Chestuee Creek	3	3		South Chestuee Creek	2	3	
Childers Creek		1		South Mouse Creek	4	3	
Coker Creek	2		1	Spring Creek (Eastern)	3	3	
Conasauga Creek	3	3	1	Spring Creek (Western)	2		3
Coppinger Creek	4			Sugar Creek	3		
Gunstocker Creek	3	1,2	2	Towee Creek	2		3
Upper Elk River	2,3		1,3	Turtletown Creek			1

Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed